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(71) Applicant(s)

Sic Trading Co Limited

(Incorporated in the Isle of Man)

26 Athol Street, DOUGLAS, Isle of Man

(72) Inventor(s)

Arnd Jacobus Brink

Jan Louis Brink

(74) Agent and/or Address for Service

Withers & Rogers

4 Dyer's Buildings, Holborn, LONDON, EC1N 2JT,
United Kingdom

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(58) Documents Cited

GB 2267072 A GB 2299228 A US 4639999 A

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ONLINE DATABASES: WPI

(54) Conveyor belt scraper

(57) A conveyor belt scraper has a blade carrier bracket 28 having two spaced side ribs 30, each having cruciform shaped apertures 40 therein for receiving the ends of complementary shaped torsional support arms fixed to a central support pedestal of a support base 20, the torsional support arms providing the scraper blade assembly with a degree of flexibility.

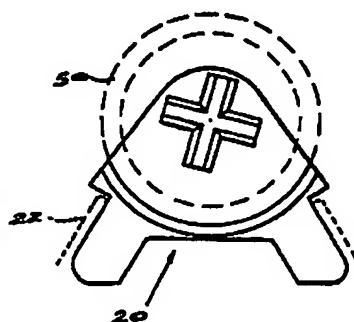


FIG 3

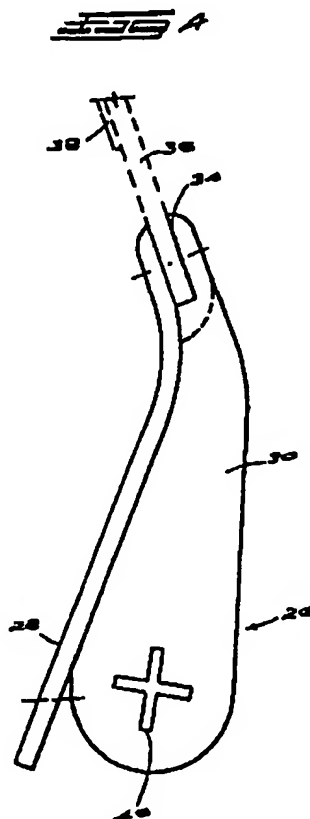


FIG 4

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FIG 1

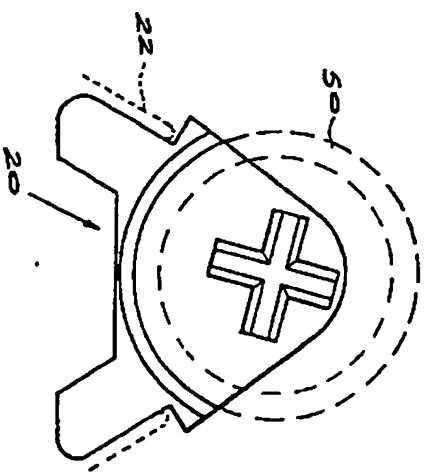
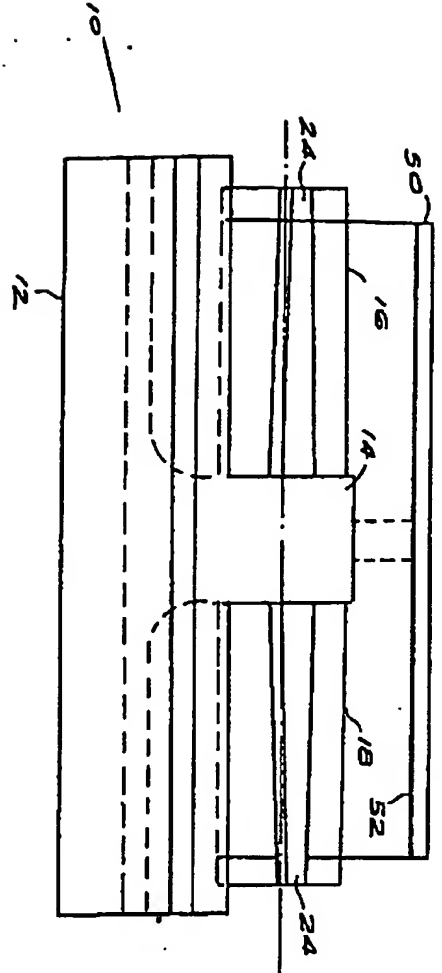
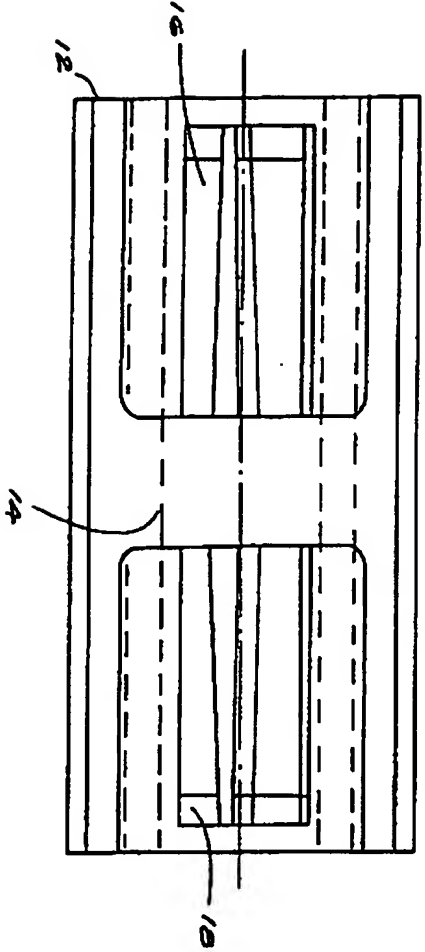


FIG 3

FIG 2



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FIG 5

FIG A

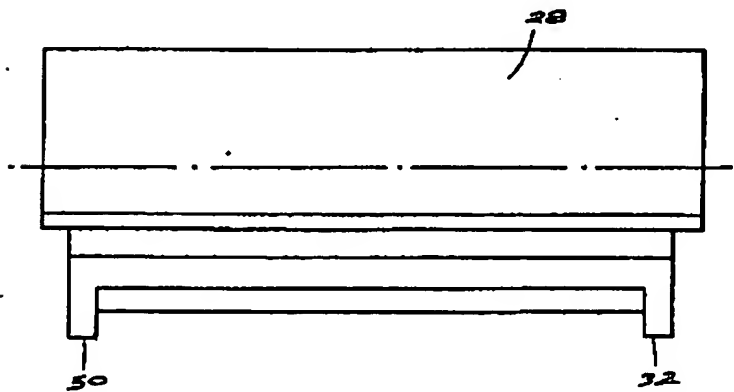
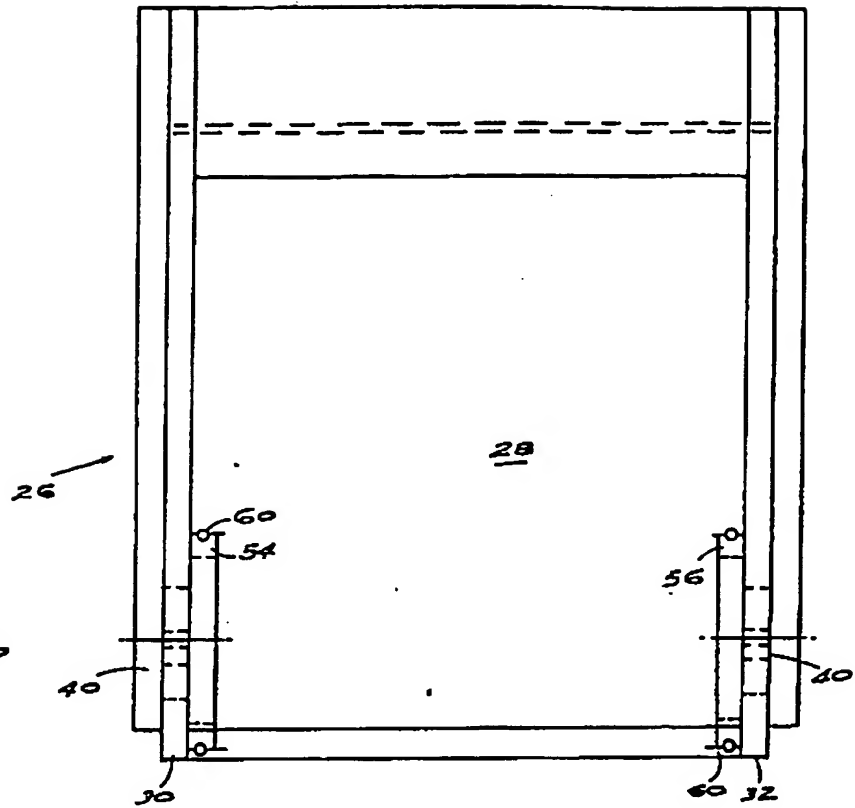
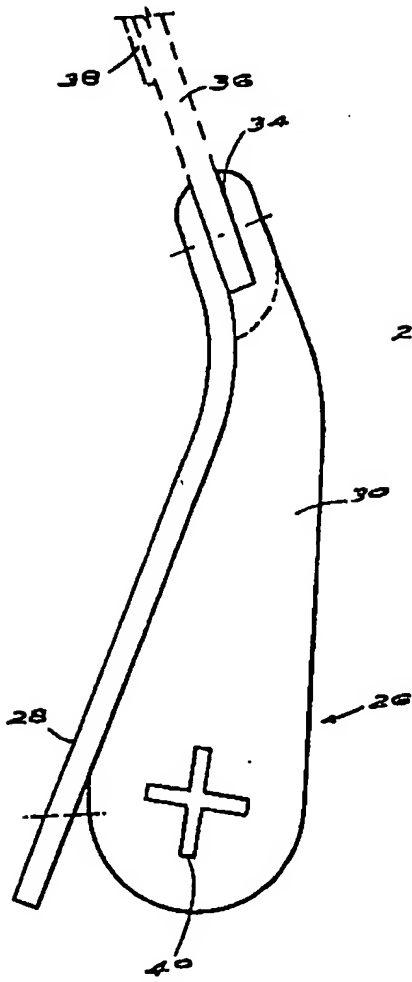


FIG 6

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BELT SCRAPER

This invention relates to a conveyor belt scraper.

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South African patent specification No.88/7595 describes a conveyor scraper assembly which includes a tubular casing in which resilient biasing inserts are located. A scraper blade is attached to a shaft positioned in the casing and cushioned by the inserts. The inserts permit resilient deflection of the scraper blade.

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The aforementioned type of construction, being fabricated, cast or forged, and then assembled, does present a number of problems during manufacture and requires consistent quality control to produce an acceptable end product.

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The invention provides a conveyor belt scraper which includes a blade carrier base with at least one torsional support arm and a blade carrier bracket mounted to the support arm.

25

The torsional support arm may be made from any suitable material and preferably is made from a plastics material. The plastics material may for example be a polyamide which optionally could include a filler of fibre or any other suitable material.

The torsional support arm is preferably cantilevered and extends from a support component of the blade carrier base.

5 The blade carrier base may include first and second torsional support arms which extend from the support component in opposed directions.

Each torsional support arm may be of any suitable dimensions and may have any suitable shape, length and cross section.

10 In one form of the invention each torsional support arm is of cruciform cross section and is generally of decreasing cross sectional area in a direction from the support component to a free end of the torsional support arm.

15 The free end of each torsional support arm may include at least one formation which is adapted to engage with a complementary mounting formation on or in the blade carrier bracket.

20 The support component may extend from a mounting member. The torsional support arms, the support component and the mounting member may be of a unitary construction and preferably are integrally moulded from a plastics material.

The mounting member may have a longitudinally extending formation which is adapted to engage with a sliding fit in a support channel.

5 The blade carrier bracket may have two spaced mounting formations which are respectively engageable with complementary formations of the first and second torsional support arms. The mounting formations may be located in ribs which are part of the blade carrier bracket.

10 The blade carrier base may include at least one substantially tubular formation which shrouds the or each torsional support arm. Each rib of the blade carrier bracket may have a locating formation or a projection such as a boss at or near a respective mounting formation intended to extend into a respective tubular formation. Sealing means, e.g. an O-ring seal, may be positioned between the boss and an opposing inner surface
15 of a respective tubular formation.

The invention is further described by way of example with reference to the accompanying drawings in which:

20 Figure 1 is a side view of a blade carrier base for use in a conveyor belt scraper according to the invention,

Figure 2 is a plan view of a blade carrier base of Figure 1,

Figure 3 is an end view of the blade carrier base of Figure 1,

Figure 4 is an end view of a blade carrier bracket for use in the belt scraper of the invention,

5

Figure 5 is a side view of the blade carrier bracket, and

Figure 6 is a plan view of the blade carrier bracket.

10

Figures 1 to 3 of the accompanying drawings illustrate a blade carrier base 10 for a conveyor belt scraper. The blade carrier base includes a mounting member 12, a support pedestal 14 and two cantilevered torsional support arms 16 and 18 respectively which extend from the pedestal in opposing directions.

15

The blade carrier base 10 is integrally moulded from a polyamide material which optionally includes a filler of fibres or of any other suitable material.

20

The mounting member 12, as is evident from Figure 3, includes a longitudinally extending channel formation 20 with sloping sides. The arrangement is such that the channel formation can be slid into a support channel 22 which is shown only in dotted lines, in order to provide a ready means of installing the blade carrier base in an operative position.

Each torsional support arm 16 and 18 is of cruciform cross section and, as is evident from Figures 1 and 2, is of generally decreasing cross sectional area extending from the pedestal to the outer or free end of each respective arm.

5

Each arm, at its free end, has a mounting formation 24 which is defined by making the sides of the ribs and core of the cruciform parallel to one another.

10

Figures 4 to 6 illustrate a blade carrier bracket 26 for use with the blade carrier base 10. The blade carrier bracket includes a deflector 28 with two spaced projecting ribs 30 and 32. At their upper ends the ribs and the deflector have slots 34 which receive a blade 36. A hardened element 38 may be attached to the tip of the blade 36.

15

The ribs 30 and 32 are formed with cross shaped apertures 40 and 42 respectively which are complementary in shape to the mounting formations 24 on the torsional support arms.

20

The blade carrier bracket 26 is easily engaged with the torsional support arms simply by bending the deflector 28 and by moving the ribs 30 and 32 apart slightly so that the support arms can be positioned between the ribs and the tips of the arms can be located in a respective formation 40. When the deflector and the ribs are allowed to straighten, and they do so

under their own inherent resilience, the formations 24 move into, and seat securely within, each of the formations 40.

The belt scraper is used in a conventional manner which is not described hereinafter.

The blade carrier base 10 is, as has been stated, integrally moulded. This substantially simplifies manufacture thereof and assembly problems are also eased. In use of the belt scraper the arms 16 and 18 flex, generally in unison. Thus the need for resilient inserts of the kind described in patent No.88/7595 is dispensed with. As the blade carrier bracket 26 is supported at two spaced locations by arms of substantially similar characteristics, the movement of the bracket 26, during use, is generally rotational only, about a central axis which passes through the two torsional support arms, and there is little or no tendency of the bracket to pivot in a different manner or to move laterally. This means that the blade 36 is maintained in scraping contact with a conveyor belt over practically over the whole length of the blade.

The blade carrier base 10, being moulded, is made to a high tolerance. The polyamide material is light and corrosion resistant. The material is also adequately self-damped and has a high life cycle. Thus vibrations which may be transferred from the blade 36 to the blade carrier base 10 are rapidly damped which means that the scraping action is not adversely

affected.

In a variation of the invention each support arm 16, 18 is shrouded by a
respective tubular element 50, 52 shown in dotted outline in Figures 1 and
5 3. These elements are formed integrally with the blade carrier base 10.

The elements 50 and 52 protect the torsional support arms against
damage caused for example by falling rocks or debris, and keep the
support arms clean, preventing a buildup of foreign material.

10

To seal the interior of each element the blade carrier bracket 26 may have
bosses 54 and 56 on the ribs 30 and 32 around the formations 40, see
Figure 5. The bosses locate inside the respective tubular elements and
can carry O-ring seals 60 to provide a sealed interior for the elements 50
15 and 52.

CLAIMS

1. **A conveyor belt scraper which includes a blade carrier base**
5 **with at least one torsional support arm and a blade carrier bracket**
 mounted to the support arm.

2. **A conveyor belt scraper according to claim 1 wherein the or**
 each torsional support arm is made from a plastics material.

10 **3. A conveyor belt scraper according to claim 1 or 2 wherein the**
 or each torsional support arm is cantilevered and extends from a support
 component of the blade carrier base.

15 **4. A conveyor belt scraper according to claim 3 wherein the**
 blade carrier base includes first and second torsional support arms which
 extend from the support component in opposed directions.

20 **5. A conveyor belt scraper according to claim 3 or 4 wherein the**
 or each torsional support arm is of cruciform cross section and is
 generally of decreasing cross sectional area in a direction from the
 support component to a free end of the torsional support arm.

6. A conveyor belt scraper according to claim 3, 4 or 5 wherein the free end of the or each torsional support arm includes at least one formation which is adapted to engage with a complementary mounting formation on or in the blade carrier bracket.

5

7. A conveyor belt scraper according to any one of claims 3 to 6 wherein the support component extends from a mounting member which is formed integrally with the support component and the or each torsional support arm.

10

8. A conveyor belt scraper according to claim 7 wherein the mounting member has a longitudinally extending formation which is adapted to engage with a sliding fit in a support channel.

15

9. A conveyor belt scraper according to claim 1 which has first and second torsional support arms, and wherein the blade carrier bracket has two spaced mounting formations which are respectively engageable with complementary formations of the first and second torsional support arms.

20

10. A conveyor belt scraper according to claim 9 wherein the mounting formations are located in ribs which are part of the blade carrier bracket.

11. A conveyor belt scraper according to claim 10 wherein the blade carrier base includes two substantially tubular formations which respectively shroud the torsional support arms.

5 12. A conveyor belt scraper according to claim 11 wherein each rib has a locating formation at or near a respective mounting formation which extends into a respective tubular formation.

10 13. A conveyor belt scraper substantially as hereinbefore described with reference to the accompanying drawings.

5 **Amendments to the claims have been filed as follows**

1. **A conveyor belt scraper which includes a blade carrier base with at least one torsional support arm which is made from a plastics material and a blade carrier bracket mounted to the support arm.**

10 2. **A conveyor belt scraper according to claim 1 wherein the or each torsional support arm is cantilevered and extends from a support component of the blade carrier base.**

15 3. **A conveyor belt scraper according to claim 2 wherein the blade carrier base includes first and second torsional support arms which extend from the support component in opposed directions.**

20 4. **A conveyor belt scraper according to claim 2 or 3 wherein the or each torsional support arm is of cruciform cross section and is generally of decreasing cross sectional area in a direction from the support component to a free end of the torsional support arm.**

25 5. **A conveyor belt scraper according to claim 2, 3 or 4 wherein the free end of the or each torsional support arm includes at least one formation which is adapted to engage with a complementary mounting formation on or in the blade carrier bracket.**

- 5 6. A conveyor belt scraper according to any one of claims 2 to 5 wherein the support component extends from a mounting member which is formed integrally with the support component and the or each torsional support arm.
- 10 7. A conveyor belt scraper according to claim 6 wherein the mounting member has a longitudinally extending formation which is adapted to engage with a sliding fit in a support channel.
- 15 8. A conveyor belt scraper according to claim 1 which has first and second torsional support arms, and wherein the blade carrier bracket has two spaced mounting formations which are respectively engageable with complementary formations of the first and second torsional support arms.
- 20 9. A conveyor belt scraper according to claim 8 wherein the mounting formations are located in ribs which are part of the blade carrier bracket.
- 25 10. A conveyor belt scraper according to claim 9 wherein the blade carrier base includes two substantially tubular formations which respectively shroud the torsional support arms.

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11. A conveyor belt scraper according to claim 10 wherein each rib has a locating formation at or near a respective mounting formation which extends into a respective tubular formation.

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12. A conveyor belt scraper substantially as hereinbefore described with reference to the accompanying drawings.

(i) UK Cl (Ed.M) B8A ALE
(ii) Int Cl (Ed.5) B65G 45/00, 45/12, 45/16

Date of completion of Search
9 AUGUST 1994

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-
1-13

(ii) ONLINE DATABASES: WPI

X:	Document indicating lack of novelty or of inventive step.	P:	Document published on or after the declared priority date but before the filing date of the present application.
Y:	Document indicating lack of inventive step if combined with one or more other documents of the same category.	E:	Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A:	Document indicating technological background and/or state of the art.	&:	Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2267072 A (BELLE BANNE)	1
X	GB 2239228 A (CONVEYOR IMPROVEMENTS)	1
X	US 4633999 (PERNECZKY)	1

Databases:The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).